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EXAMINER	
CHENG, PETER L	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/678,993	**Applicant(s)** DEER ET AL.	
	Examiner PETER L. CHENG	**Art Unit** 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) *8-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **6/17/2008** has been entered.

2. It should be noted that in **line 10** of the amended **claim 1**, the word "retrieved" was also added to the claim although it is not shown underlined;

Claim Objections

3. Claim 1 is objected to because of the following informalities:

- **Line 5:** it is assumed that applicant intended to cite **signature color data lookup table** instead of **signature color data lookup**;

4. Claim 4 is objected to because of the following informalities:

- **Line 4:** "**subdividing**" implies a *prior division*; suggest replacing **subdividing** with **dividing**, **grouping** or **associating**;

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Specifically, **claim 1, line 5** cites **including only a subset of said color data**, and **claim 3, line 5** refers to **said subset of said color data contained in said signature color data lookup table**.

The subject matter which was not described in the original disclosure (**page 7, line 32** through **page 8, line 4**, or **page 8, lines 30 - 32**) is underlined above. The **original claim 1** cited,

> measuring a plurality of test patches to obtain *color data* associated with said imaging object;
>
> generating a signature color data lookup table based on *said color data*;

The **amended claim 1** cites,

> measuring a plurality of test patches to obtain *color data* associated with said imaging object;
>
> generating a signature color data lookup [[table based on]] including only a subset of *said color data*;

Per **page 8, lines 30 – 32** of the original specification, it is assumed that applicant intended to cite,

> measuring a plurality of test patches to obtain *color data* associated with said imaging object;
>
> generating a signature color data lookup table based on *said color data*,

> *wherein, the size of said signature color data lookup table is much smaller than said standard color conversion lookup table;*

or *similar wording*.

In addition, if applicants had intended to cite that the *signature color data lookup table* is based on a subset of colors contained in the larger *standard color conversion table*, a *subset* specifies that points chosen must also be contained in the larger table. Likewise, this subject matter was also not contained in the original disclosure.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by **BOWERS [US Patent Application 2002/0126301 A1]**.

As for claim 1, BOWERS teaches a method for correcting color shift in an imaging system having an imaging object

[BOWERS teaches an “imaging object” (i.e., a printing cartridge); see **Fig. 2** ink cartridge. **Fig. 4** illustrates a process for a “calibration process of adjusting the output color value to be equal to the input color value”; **page 2, paragraph 19, lines 3 - 4],**

and having a standard color conversion lookup table associated with said imaging object

[Fig. 3A and **3B** illustrate a “pre-existing color lookup table (LUT)”; the “standard conversion lookup table” corresponds to the “pre-existing color lookup table”; in **Fig. 3A,** the color conversion table is stored in a computer; **page 1, paragraph 18, lines 7 – 9;** in **Fig. 3B,** the color conversion table is stored in the printer; **page 1, paragraph 18, lines 9 – 12]**,

comprising the steps of

measuring a plurality of test patches to obtain color data associated with said imaging object

[Fig. 1 print set of color patches; “An initial set of color patches is printed from at least one printer and on at least one print substrate”; **page 1, paragraph 15, lines 3 – 4.** BOWERS specifies “printing a set of color patches *from* a predetermined set of input values”; **claim 1, lines 3 – 4**.

Fig. 1 measure color patches; "The printed color patches, having a predetermined input value, are measured for color values, such as tristimulus values"; **page 1, paragraph 16, lines 1 – 3.** See also, **claim 1, line 5];**

generating a signature color data lookup table ~~based on~~ including only a subset of said color data

[Fig. 1 generate calibration data; "The input and measured color values, or raw data, are used to generate calibration data"; **page 1, paragraph 17, lines 2 – 3.** The calibration data corresponds to the "signature color data lookup table".

In **claim 1, line 6**, BOWERS specifies, "generating calibration data including color values". BOWERS teaches that the *calibration data* may be either "the predetermined input values and the measured color values" [**page 1, paragraph 19, lines 5 - 6**] or "a color LUT with adjusted color values"; **page 2, paragraph 19, lines 7 – 8.**

Since the calibration data is based on the *measured color values* which in turn, are based on a "set of color patches *from a predetermined set of input values*", when BOWERS' calibration data is a "color LUT with adjusted color values", this color LUT includes only a subset of color data from a predetermined set of input color values**];**

storing said signature color data lookup table in a memory associated with *one of* said imaging object, said imaging system, or an offsite location, for access by said imaging system

[The calibration data is stored preferably on a memory embedded in an ink cartridge. The LUT may also be stored on the memory"; **page 1, paragraph 17, lines 5 – 9];**

installing said imaging object into said imaging system

[BOWERS teaches that "it would be an advantage for a customer to purchase an ink cartridge with the color data already included in the memory of an ink cartridge to achieve the desired output color values"; **page 1, paragraph 5, lines 7 – 10. Fig. 4** illustrate a process by which the "signature color data lookup table" (i.e., calibration data) is read from an installed printing cartridge**];**

retrieving said signature color data lookup table from said memory

[Fig. 4 step "read calibration data from ink cartridge"**].**

and combining said signature color data lookup table retrieved from said memory with said standard color conversion lookup table to generate a composite color conversion lookup table for use with said imaging object

[BOWERS teaches that the "standard color conversion lookup table" (i.e., the "pre-existing color lookup table") "may be replaced, modified, or updated with the new color LUT generated in Fig. 1. Also, an adjustment value may be added to the pre-existing color LUT"; **page 1, paragraph 18, lines 13 - 17].**

Regarding claim 2, BOWERS further teaches the method of claim 1, wherein

said imaging object is *one of* a printing cartridge, a scanner and a substrate

[BOWERS teaches an "imaging object" which is a "printing cartridge"; **see Fig. 2].**

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **BOWERS [US Patent Application 2002/0126301 A1]** in view of **BALASUBRAMANIAN [US Patent 5,739,927]**.

Regarding claim 3, BOWERS *does not specifically teach* the method of claim 1, ~~**2, further comprising the steps of:**~~

> ~~**storing said signature color data lookup table in a memory associated with one of said imaging object, said imaging system, or an offsite location, for access by said imaging system;**~~
>
> ~~**installing said imaging object into said imaging system;**~~
>
> ~~**and retrieving said signature color data lookup table from said memory**~~
>
> **wherein said subset of said color data contained in said signature color data lookup table is formed by selecting a pre-determined number of even-spaced points over a whole range of points along each primary color axis of a plurality of primary color axes.**

BALASUBRAMANIAN teaches a "method for refining an existing printer calibration using a small number of measurements". BALASUBRAMANIAN's "refinement table**16**" corresponds to the “signature color data lookup table”. Once created, it can be combined with the “color correction table **10** into one table”; **col. 5, lines 15 – 17.**

To create the refinement table **16**, “a set of N RGB color $\{X_i\}$, $1 \leq i \leq N$, are selected (step 10a), mapped through the color correction table **10** (step 10b), printed, and measured (step 14a) to obtain a corresponding output set of RGB coordinates $\{X'_i\}$. The number N is small in relation to the size of the color correction table. Typically, N is on the order of 40 to 200 locations for adequate correction of drift”; **col. 3, line 67 – col. 4, line 6**.

“The refinement table maps the X'_l to X_i. The look-up table **10** has a set of M node locations, denoted Z_j. A typical value for M is $16^3 = 4096$. In general, Z_j will not coincide with the measured X'_l. Hence, in order to fill the table, an interpolator 22 interpolates the known transformation values $\{t_i\}$ at the locations $\{X'_i\}$ $1 \leq i \leq N$, to the table node locations Z_j, $1 \leq j \leq M$”; **col. 4, lines 34 – 10.**

“To refine the printer response accurately, it is undesirable for any RGB node location Z_j to be far from one of the selected measured locations X'_i. To reduce the occurrences of this problem, the initially selected measurement locations $\{X_i\}$ are chosen to span the printer gamut so that no inputted RGB location is distant from all the measured RGB locations $\{X'_i\}$. *Alternately*, if a user wishes to *refine a particular region* of the printer gamut, RGB locations from the particular region are chosen as the measurement locations to refine the color correction table"; **col. 4, line 65 – col. 5, line 7.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of BALASUBRAMANIAN with those of BOWER to *select a pre-determined number of even-spaced points over a whole range of points along each primary color axis of a plurality of primary color axes* so that the color correction refinement table **16** would span the entire region of the printer gamut as represented by the color correction table **10**.

12. Claims 4 - 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over **BOWERS [US Patent Application 2002/0126301 A1]** in view of **NAGATANI [US Patent Application 2001/0055420 A1]**.

Regarding claim 4, BOWERS *does not specifically teach* the method of claim 2, wherein said generating step includes:

> **generating a plurality of signature color data lookup tables for a plurality of imaging objects of a same type;**
>
> **subdividing said plurality of signature color data lookup tables for said plurality of imaging objects of said same type into classes of signature color data lookup tables based on a color similarity;**

> **generating a color class table for each class of signature color data lookup tables;**
>
> **assigning a class code to each said color class table;**
>
> **storing each said color class table in at least *one of* a first memory associated with said imaging object, a second memory associated with said imaging system, and an offsite memory, for access by said imaging system;**
>
> **and storing said class code in at least *one of* said first memory associated with said imaging object, said second memory associated with said imaging system, and said offsite memory, for access by said imaging system.**

NAGATANI teaches a color correction method that takes into account "an inherent difference" of a printer's "ink head"; **page 1, paragraph 7, lines 4 – 6; page 1, paragraph 5, lines 1 – 5.**

NAGATANI refers to this "inherent difference" in the printhead as a "head rank" and cites, "A calibration module 208 serves to newly produce a database file 212 suitable for a *reproducing property* of the present printer on the basis of the original database file

211. Namely the calibration module produces a database file depending upon inherent difference and/or time-lapse change of an ink head of the printer. For example, by picking up head ID as head identification information and head rank information (for example, C: +2, M: 0, Y:-1 K:+1) as information representing the *reproducing property of the head* from the printer body by means of a printer driver and by informing the calibration module of such information, a database file including an LUT (gradation correction table 223 in FIG. 4) corresponding to such head rank is produced"; **page 2, paragraph 39.**

NAGATANI illustrates an example of a method for producing the LUT corresponding to the head rank by the calibration module; **page 3, paragraph 56.** "As shown in Fig. 13, gradation correction tables corresponding to all ranks 603 regarding all colors 602 in all media 601 are held in the calibration module. On the basis of the inputted rank, the gradation correction table is formed"; **page 3, paragraph 58.**

"An example of the gradation correction tables corresponding to the respective head ranks 603 is shown in FIG. 11"; **page 3, paragraph 59, lines 1 – 3.**

In addition to correcting gradation based on head rank, NAGATANI teaches that "the calibration may be used to form … *LUTs required for the color correction / color conversion, rather than the gradation correction tables*. When such LUTs are formed, a plurality of patches may be formed by the printer and the formed patches may be measured and the LUTs may be formed on the basis of the measured results”; **page 4, paragraph 80.**

With respect to

> **generating a plurality of signature color data lookup tables for a plurality of imaging objects of a same type,**

NAGATANI teaches generating a plurality of gradation correction tables as shown in **Fig. 11** for head ranks -2, -1, 0, +1, +2; **page 3, paragraph 60.** These correction tables are for “imaging objects of a same type” (i.e., same color printhead); that is, as shown in **Fig. 13**, there is a plurality of correction tables **603** for each color printhead type **602**. As noted, these correction tables may instead be “color correction / color conversion tables” based on head rank.

With respect to

> **subdividing said plurality of signature color data lookup tables for said plurality of imaging objects of said same type into classes of signature color data lookup tables based on a color similarity,**

As shown in **Fig. 11,** NAGATANI teaches dividing the color correction tables into *classes* of tables based on a *color similarity* (i.e., the head rank). NAGATANI cites, “The rank ‘+’ represents the fact that an ink discharge is great in comparison with the rank ‘0’ and the fact that the ink is stronger. On the other hand, the rank ‘-‘ represents the fact that the ink discharge amount is smaller and the ink the weaker”; **page 3, paragraph 61.**

With respect to

> **generating a color class table for each class of signature color data lookup tables,**

NAGATANI teaches dividing the color correction tables into *classes* of tables based on a *color similarity* (i.e., the head rank). **Fig. 11** illustrates five “color class tables”, **401**, **402**, **403**, **404**, and **405**.

With respect to

> **assigning a class code to each said color class table,**

NAGATANI teaches identifying each head rank by a “head ID as head identification information and head rank information”; **page 2, paragraph 39, lines 6 – 8.**

With respect to

> **storing each said color class table in at least *one of* a first memory associated with said imaging object, a second memory associated with**

> **said imaging system, and an offsite memory, for access by said imaging system;**

NAGATANI teaches storing correction tables in the calibration module and cites, "As shown in Fig. 13, gradation correction tables corresponding to all ranks 603 regarding all colors 602 in all media 601 are held in the calibration module. On the basis of the inputted rank, the gradation correction table is formed"; **page 3, paragraph 58.**

With respect to

> **storing said class code in at least *one of* said first memory associated with said imaging object, said second memory associated with said imaging system, and said offsite memory, for access by said imaging system.**

NAGATANI teaches that the head identification information and head rank are obtained from the print head by the "printer body"; **page 3, paragraph 54, lines 1 – 4.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of BOWERS with those of NAGATANI and classify printheads *of the same type* by a "head rank" so that the corresponding color conversion LUTs could be calibrated based on the amount of ink discharged for a particular printhead. This is also known in the art as drop volume calibration.

Regarding claim 5, BOWERS *does not specifically teach* the method of claim 4, further including the step of

> **associating said imaging object with a corresponding color class table, said corresponding color class table serving as said signature color data lookup table**

As noted for claim 4, NAGATANI teaches associating a color printhead, which may be incorporated in BOWERS' ink cartridge, with a "head rank". As shown in **Fig. 13,** the head rank is used to obtain a corresponding color correction table; **Fig. 13** illustrates gradation tables but, as noted, NAGATANI teaches that the correction table may also be for color conversion.

Regarding claim 6, BOWERS *does not specifically teach* the method of claim 5,

> **wherein said associating step includes associating said class code with said imaging object.**

As noted for claim 4, NAGATANI teaches associating a color printhead with a "head rank". The head identification and head rank correspond to the "class code".

Regarding claim 7, BOWERS *does not specifically teach* the method of claim 5, further comprising the steps of:

> **installing said imaging object into said imaging system;**

retrieving said class code from said first memory, said second memory, *or* said offsite memory;

and retrieving said signature color data lookup table from said first memory, said second memory, *or* said offsite memory.

As noted for claim 4, NAGATANI teaches obtaining the printhead's "head ID" as information "representing the reproducing property of the head from the printer body by means of a printer driver and by informing the calibration module of such information, a database file including an LUT … corresponding to such head rank is produced"; **page 2, paragraph 39, lines 6 – 13.**

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- **CHU [US Patent Application 2002/0149785 A1]**
- **CHAN [US Patent 5,107,332]**
- **OSHIKAWA [US Patent 7,333,239 B2]**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625
plc
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